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law among our states, so strong in commercial topics, is little felt in church law.

In view of this innate difficulty in his subject it is surprising how thorough, how sound, and how readable this book is. The citation of authorities is full; the conception of the differing forms of organization is sympathetic; the conclusions are lawyer-like and convincing. The scope of the work is broad. After an excellent discussion of the legal meaning of religious liberty, the author deals successively with the forms, nature, and powers of church corporations; church constitutions; implied trusts; schisms; the decisions of church courts; exemptions from taxation; illegal disturbance of meetings; contracts; clergymen; officers; holding property by dedication and adverse possession; pew rights; and church cemeteries. A chapter on the Methodist Episcopal Deed concludes the book. The arrangement might be criticized as somewhat heterogeneous; a more logical arrangement of the matter would perhaps have cleared up one or two difficulties. Nevertheless, the seeker may easily find the topic which interests him; he will find it clearly stated, thoroughly discussed in the light of all the authorities, and illuminated by the author's conclusion. At the end of each chapter he will find an admirable and useful summary of the contents of the chapter.

The book will be valuable to all those who are concerned with the temporalities of the Church.

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THE ORDER OF NATURE. LAWRENCE J. HENDERSON. Harvard University Press. 1917. Pp. 234. \$1.50.

The fitness of organisms to their environment has been an unceasing wonder to men in general and a fascinating riddle to biologists in particular. No satisfactory mechanistic explanation of this fitness, however, has yet been given. The Darwinian factors act only as pruning shears and not as creative forces. Natural selection may possibly explain the survival of the fittest, but it does not explain their arrival. Doubtful as a theory of physiological evolution, the Darwinian hypothesis is only too obviously inadequate — as Darwin, Huxley, Kropotkin, and many other biologists have repeatedly pointed out — as an explanation of social evolution. Nevertheless, largely through the influence of such biologists as Haeckel and Weismann in Germany, the dogma of the *Allmacht* of natural

selection in racial progress has been made the foundation of Teutonic political and military policies. The world is now suffering the terrible consequences of pseudo-science and pseudo-philosophy carried out into rigorous action by the military masters of a nation. Fortunately for the world, England has had wiser scientific and political leadership. This, however, is somewhat aside from the main point of this review. But it goes to prove that scientific theories, however abstract and apparently impracticable, may nevertheless have the greatest influence upon the welfare of the human race. In the opinion of the reviewer, Henderson's *Order of Nature* is a book which will strongly influence the scientific thought of the future.

In his thoughtful book on *The Fitness of the Environment* Dr. Henderson discussed the problem of organic fitness from an original standpoint, calling attention especially to the reciprocal character of this fitness. Not only are organisms adapted to their environments but the world is discovered to be "the fittest possible abode for life." In saying this, however, it should be understood that Professor Henderson has in mind not the purely biological problem of the lock-and-key relationship of organism and environment, but the more inclusive problem of the fitness of the world to life in general. Failure to understand his problem has misled several critics of this earlier work.

Theological readers will find *The Order of Nature* interesting for at least two reasons — first, because the book is a masterly survey and summary of the history of teleological thought from Aristotle to Bosanquet, and, second, because the author, mechanist as he is, is nevertheless led after a careful analysis of the problem of the order of nature to accept the conclusion of Aristotle that "the contrast of teleology and mechanism is the very foundation of the order of nature, which must ever be regarded from two complementary points of view." Such a view coming from a theological writer would not be in the least surprising, but coming from a mechanistic thinker it appears symptomatic of the clearer perception on the part of the younger generation of scientific men of the inadequacy of a purely mechanistic interpretation of nature. The teleology which Professor Henderson thinks he discovers in nature, however, is not of the anthropomorphic sort. He will have none of that.

He attempts to demonstrate a hitherto unrecognized order among the properties of matter and to examine the teleological character of this order. He states his problem as follows: "The simpler and more general problem of the teleology of nature as a whole has been

neither recognized nor investigated by science. Yet the problem is now clear enough. All men admit in the teleological appearance of the world something that is real. There is order, stability, and a richly varied collocation of material objects at the basis of it. When we think of the solar system, the meteorological cycle, and the organic cycle, we distinguish that which quite inevitably and directly impresses us as harmonious. Now, as we have seen, it is no longer permissible to doubt that this impression of harmony corresponds to an order in the universe. No doubt science must put aside the philosophical problems which thus arise, and philosophy must deny to all men the right to found a system of natural theology upon the fact. But it is a false and discredited metaphysical hypothesis which leads to the denial of the order of nature as a subject of scientific research. How then is the production of this order to be scientifically explained? What is the mechanistic origin of the present order of nature? . . . The real scientific problem may be approximately solved by discovering, step by step, how the general laws of physical science work together upon the properties of matter and energy so as to produce that order." Thus the problem is an evolutionary one.

Special stress is laid by Professor Henderson upon the unique properties of carbon, hydrogen, and oxygen, which are such as to lead to the presence of water on the earth and of carbon dioxide in the atmosphere as well as to the meteorological cycle, which "regulates the temperature of the globe more perfectly than it could be regulated by any other substances concerned in any other similar cycle." Their chemical properties "lead to an even greater variety of chemical combinations and chemical reactions, to an unequalled diversity of properties in their products." Thus they make up "the most remarkable group of causes of the teleological appearance of nature."

Professor Henderson logically concludes that "the properties of hydrogen, carbon, and oxygen make up a unique ensemble of properties, each one of which is itself unique. This ensemble of properties is of the highest importance in the evolutionary process, for it is that which makes diversity possible. To this end it provides materials, and in large measure the necessary stability of conditions. We have already seen that diversity, as Spencer declared, is radically necessary to evolution. . . . We may therefore conclude that there is here revealed an order or pattern in the properties of the elements. This new order is, so to speak, hidden, when one considers the properties of matter abstractly and statically, for it is recognizable and intelligible only through its effects. It becomes evident only when time is taken into consideration. The environment into which life enters

is indeed 'the fittest.'" The organism, however, "so we fondly hope, is ever becoming more fit, and the law of evolution is the survival of the fittest."

"Nor can we look upon either of these peculiarities of the matter which makes up the universe as in any sense the work of chance or as mere contingency. There is in truth not one chance in countless millions of millions that the many unique properties of carbon, hydrogen, and oxygen, and especially of their stable compounds, water and carbonic acid, which chiefly make up the atmosphere of a new planet, should simultaneously occur in the three elements otherwise than through the operation of a natural law which somehow connects them together. There is no greater probability that these unique properties should be without due (that is, relevant) cause uniquely favorable to the organic mechanism. These are no mere accidents; an explanation is to seek. It must be admitted, however, that no explanation is at hand. . . . Hence we are obliged to regard this collocation of properties as in some intelligible sense a preparation for the processes of planetary evolution. . . . Therefore the properties of the elements must for the present be regarded as possessing a teleological character."

"It will perhaps be objected to this argument that the cause of the peculiar properties of the three elements is conceivably a simple one, such as the properties of the electron. This is perfectly true, but quite beside the point. For, whether simple or complex in origin, the teleological connection — the logical relation of the properties of the three elements to the characteristics of systems — is complex. This complex connection is almost infinitely improbable as a chance occurrence. But the properties of electrons do not produce logical connections of this kind, any more than they produce the logical connections of the multiplication table; for, like the properties of the electrons, such relations are changeless characteristics of the world. Such is the one positive scientific result which I have to contribute to the teleological problem."

In reaching the important conclusion that the properties of the elements are somehow a preparation for the evolutionary process, Dr. Henderson suggests that such a hypothesis has two defects: "In the first place, the term 'preparation' is scientifically unintelligible. Secondly, this hypothesis is not only novel but it is different in kind from all recognized scientific hypotheses. For no other scientific hypothesis involves preparations except those which originate in the organism. In short, we are face to face with the problem of design." Knowledge of the history of human thought, however,

leads Professor Henderson to avoid the use of the term "design." Consequently he modifies his statement, and asserts that "the connection between the properties of the elements and the evolutionary process is teleological and non-mechanical. . . . According to the theory of probabilities, this connection between the properties of matter and the process of evolution cannot be due to mere contingency. Therefore, since the physico-chemical functional relationship is not in question, there must be admitted a functional relationship of another kind, somewhat like that known to physiology. This functional relationship can only be described as teleological. . . . Therefore the contrast of mechanism with teleology is at the very foundation of the order of nature."

Henderson's argument is briefly summarized as follows: "The principal peculiarity of the universe which makes diversity of evolution possible is original and anterior to all instances of the processes which it conditions. And we may recall the fact that this peculiarity consists of a group of characteristics such that they cannot be regarded as merely contingent. Finally, it will be remembered that *the relation of this group of properties to the characteristics of systems is also such that it cannot be merely contingent*. I believe these statements to be scientific facts. If this be so, we have arrived at the solution of a special case of Aristotle's problem of 'the character of the material nature whose necessary results have been made available by rational nature for a final cause.'" Therefore, the conclusion seems necessary that "the contrast of mechanism with teleology is at the very foundation of the order of nature, which must ever be regarded from two complementary points of view, as a vast assemblage of changing systems, and as an harmonious unity of changeless laws and qualities working together in the process of evolution."

The broad scope of the book is revealed in its chapter headings — Aristotle, The Seventeenth Century, The Eighteenth Century, Biology, Nature, Evolution, The Problem, The Three Elements, The Teleological Order. There is in addition an Appendix with brief but important essays by Clerk Maxwell and Fechner. The book will greatly enhance the reputation of its author as a master of the larger problems of science — the *Magnalia Naturæ*.

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